found that prisms are often required, not only with the base in or out, but also either upwards or downwards, as the case may be. This is not done to produce monocular vision, for if the prism is too strong the patient complains of the disturbance. I give a prism of one or two or more degrees, according to the difference in the height of the two eyes. In order to relieve asthenopic symptoms, the muscles should be exercised. Not only by Dyer's method, but also by exercising the muscles of the whole body. In many cases of severe asthenopia, the greatest relief has been obtained by having the patient take boxing lessons. Even in young ladies I have had good results with this method.

CASES OF DISEASE OF THE FRONTAL SINUS.

By CHARLES J. KIPP, M.D.,
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Case I.—Abscess of Frontal Sinus, Ethmoidal Cells and Sphenoidal Sinus.

John Bredfelt, fifty-four years of age, in good health, consulted me in March, 1883, with regard to double vision and pain in the head. He had suffered for many years from frontal headache, but had otherwise always enjoyed good health. A year ago he first noticed the diplopia, and since then a gradual protrusion of the eye has taken place.

I found that the left eye was pushed downward, outward and slightly forward, the cornea of this eye standing about 1 cm. below that of the other eye. The mobility of the eye was decidedly impaired upward and inward. The eyelids were normal, except that the upper was rather fuller than that of the opposite side. Palpation discovered a nodular tumor of irregular form which was adherent to the upper half of the inner and nearly the whole of the upper margin of the orbit. It projected about 1.5 cm. towards the eye, and extended backward in the orbit as far as the finger could reach. It felt hard and unyielding to the finger. No fluctuation could be discovered. No pulsation of the tumor could be detected.

The sight of this eye was normal, and the ophthalmoscopic examination revealed no abnormity, except slight hyperæmia of the retinal veins. I supposed that the tumor was a sarcoma connected with the periosteum of the orbit, and advised its removal.

The sight of the right eye was perfect; it was slightly myopic. A few days later, the patient being under ether, I made an incision along the upper margin of the orbit, exposing the tumor. I then introduced my finger to ascertain the character and extent of the tumor, and learned that it was in parts as hard as bone. While still exploring, I felt a break in one of the hard parts of the tumor, and a moment later a considerable quantity of very fetid pus escaped from the incision. I now endeavored to ascertain the extent of the abscess by means of a probe, and found it to extend so far upward and backward that I concluded to abstain from further exploration. I made a free opening in the wall of the abscess, evacuated a large quantity of offensive purulent matter, and introduced a large drain-tube into the opening. When the patient became conscious he complained of a horrible odor in his nose, and expectorated much fetid pus. After this the cavity was washed out daily with a warm and very weak solution of salt, some of which escaped from the nose.

For ten days after the operation the patient was apparently doing remarkably well, the eyeball had resumed its normal position, the diplopia was less, the headache had almost entirely disappeared and the patient was entirely free from fever. But on the eleventh day he showed symptoms of pneumonia, which in spite of the most assiduous attention ended fatally on the 17th day after the operation.

The autopsy was made on the following day by Dr. R. Staehlin, who had treated him for the pneumonia, and myself. The examination showed that the frontal sinus, the ethmoidal cells and the sphenoidal sinus had been converted into one large cavity, which contained some pus in its lowest part. The bony walls of the cavity were carious, and numerous sharp spiculæ of bone projected from the walls. The inner surface of the cerebral plate of the horizontal process of the frontal

bone was discolored in several places, but not roughened. The dura mater over these places as well as everywhere else was normal, and the other meninges and the brain itself were apparently healthy. The floor and outer wall of the abscess consisted of very much thickened periosteum, in which a number of thin scales of bone were imbedded, and in one of these the opening was found from which the pus had escaped during the exploration. The lungs showed a simple pneumonia; there were no abscesses, and none of the other usual appearances of metastatic pneumonia.

Remarks.—The mistake made in the diagnosis of this case seems unavoidable. The slow development of the tumor, its size, hardness and inelasticity, the irregularity of its surface, and the absence of all inflammatory symptoms, made it extremely probable that the tumor was a fibroma or sarcoma originating in the periosteum of the orbit. Fortunately, this error in diagnosis resulted in no harm to the patient, for, had I known the true character of the disease, I should have operated as I did, but I should have been more guarded in my prognosis. In no other case have I seen the bony partition between the frontal sinus, the ethmoidal cells and the sphenoidal sinus so completely destroyed as in this.

CASE II.—DISTENSION OF THE FRONTAL SINUS.—CURED BY APPLICATIONS TO THE MUCOUS MEMBRANE OF THE NOSE AND PRESSURE ON THE TUMOR.

Mrs. N. A. W., fifty-seven years of age, a large and healthy looking woman, consulted me with regard to a painful swelling below the left eyebrow, in October, 1882. According to her statement she had for many years suffered almost constantly from a severe pain in the left frontal region. The tumor began to appear six months ago, and had since steadily increased in size. She had not sustained any injury to the nose or head, but had always had naso-pharyngeal catarrh.

The tumor was about the size of a hickory nut, and was immovably attached to the inner upper angle of the orbit. It extended into the orbit as far as the finger could reach. The surface of the anterior part was smooth, that of the posterior

portion nodular. The tumor was quite hard, but on deep pressure fluctuation could be felt. The skin over the tumor was normal and not adherent to the swelling. The eyeball was pushed slightly downward and outward, and its movement upward and inward was somewhat impeded. The diplopia did not annoy the patient very much. The examination of the fundus of the eye showed nothing abnormal. With the exception of great swelling and congestion of the mucous membrane, nothing abnormal could be detected in the nose.

There could be no doubt that the tumor was caused by the distension of the frontal sinus, and I therefore advised the patient to have an operation made for the purpose of establishing communication between the nose and the frontal sinus. This the patient declined to have done.

I did not see the patient again till July 21, of the following year. At this time the tumor was somewhat larger than it had been when I first saw her, but otherwise it had not changed. There was now in addition much injection and œdema of the ocular conjunctiva and a shallow ulcer in the center of the cornea. The eye became painful several days ago, and the redness was first noticed two days before. The patient attributed the eye trouble to overheating while working in the field, and was sure that the eye had not received a traumatic injury. I prescribed fomentations with a warm solution of boracic acid, and instillations of atropia. Under this treatment the ulcer healed completely in about twenty days. While under treatment for the corneal ulcer I frequently examined the tumor, and on one of these occasions felt it to give way, and on pressing somewhat harder I evacuated the cyst almost entirely. At the same time the patient felt something exceedingly disagreeable in taste in her mouth, and expectorated a considerable quantity of very offensive, bloody, mucopurulent matter. I now learned from the patient that the swelling had "broke inwardly" several times during the last few months, and the discharge had on each of these occasions been exceedingly offensive.

I applied solution of nitrate of silver to the mucous membrane of the nose, and frequently washed out the nose with

warm salt water, and at the same time instructed the patient to evacuate the cyst by pressure very frequently through the day. For some weeks after this the cyst refilled very quickly, and at one time an inflammation of the skin over the tumor was developed, which spread also over the right half of the forehead. Under the application of ice compresses this subsided, however, very quickly.

Until the first of May, 1884, the patient was free from pain in eye and forehead; the cyst became distended but rarely, and when it did it could be emptied by slight pressure. Although always of a disagreeable taste and odor, the discharge had not been offensive for several months. The diplopia had entirely disappeared.

In the early part of May, while apparently in excellent health, she had a severe chill, followed by fever and sweating. I saw her on the following day, but could find no marked change about the frontal bone. The ophthalmoscopic examition revealed indistinctness of margin of optic disk, but no other abnormity. Quinine was given for a week, and no other paroxysm of fever occurred.

Since then the patient has enjoyed excellent health. The tumor has not reappeared for many weeks, and the optic disk is again entirely normal. The skin over the inner upper margin of the orbit is somewhat thickened, but otherwise normal. The defect in the inner upper angle of the orbit is about the size of a ten cent piece, and its margin is markedly nodular, several of the nodules being about the size of a pea. The end of a finger can almost be pushed through the defect into the frontal sinus. The mucous membrane of the nose is still swollen, although the swelling is much less than it was six months ago. Now, it is not an uncommon occurrence for air to enter the frontal sinus and distend it when she blows her nose.

Remarks.—This case seems worth reporting, as it shows that in some cases, at least, this disease can be cured, without resorting to an incision in the outer wall of the distended sinus. In nearly all of the cases that I have seen in which the sinus was thus opened, a permanent fistula remained, caus-

ing much annoyance and some deformity, and any method of treatment not involving such an incision, and yet giving as good results, will, I have no doubt, be welcomed. It can certainly do no harm, if it does no good, to endeavor to cure or at least improve the morbid condition of the lining membrane of the nose which will be found to be present in most, if not all of the cases of distension of the frontal sinus. Attempts to empty the sinus through its obstructed or closed passage into the nose by digital pressure on the swelling should be made from time to time, and after the sinus has been once emptied it should be evacuated at short intervals. If, after a fair trial of this treatment, the distension continues, the old method of treatment may be resorted to.

A CASE OF GLIOMA OF THE RETINA (DOUBLE-CONGENITAL).

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A FEMALE child, eight months old, was seen at The Eye Clinic, Jefferson Medical College Hospital, by Prof. William Thomson, M.D., June 11, 1882, glioma of the retina of both eyes being diagnosed; the size of the growth in the right eye was quite marked, giving a white reflex from the pupil, and most prominent at the temporal side; sight was lost in this eye; the left eye gave a white reflex to the temporal side only; some vision remained in this eye. An unfavorable prognosis was given, as far as sight was concerned, and later a fatal result was to be expected.

Enucleation of each eye was advised, but all interference was rejected.

Nothing further was seen of the case, till I was requested by Dr. O. H. Fretz to see the case on March 30, 1884, a fatal result being soon expected. The child was the youngest of eight children, the eldest having died of yellow fever in Peru; all the others were well and hardy. The grandparents